

Listing of Claims

Claim 1 (currently amended): A method of treating a metal surface comprising:

- a) roughening the metal surface;
- b) priming the roughened metal surface with a liquid primer composition comprising ~~one or more organo-silicon compounds, one or more silsesquioxanes, or mixtures thereof,~~ and an organic polymer, an organic oligomer, an organic monomer, or mixtures thereof; and
- c) applying a polymer material to the roughened metal surface with the liquid primer to form a bond with the roughened metal surface.

Claim 2 (Original): The method of claim 1, wherein mechanical pressure, heat or combinations thereof are applied to form the bond between the polymer material and the roughened metal surface.

Claim 3 (Withdrawn): The method of claim 1, wherein the organic polymer comprises a polyimide, a poly(meth)acrylate, a polycyanoacrylate, a rubber, a polyurethane, a butadiene, or mixtures thereof.

Claim 4 (Withdrawn): The method of claim 1, wherein the organic oligomer comprises a urethane oligomer.

Claim 5 (Withdrawn): The method of claim 1, wherein the organic monomer comprises a (meth)acrylate, an isocyanate, melamine glycoural cross-linker, or a heat activated methyol.

Claim 6 (Withdrawn): The method of claim 1, wherein the liquid primer further comprises one or more epoxy.

Claim 7 (Canceled)

Claim 8 (Original): The method of claim 1, wherein the organic polymer, organic oligomer, or organic monomer comprises from 0.5% by weight to 95% by weight of the liquid primer.

Claim 9 (Original): The method of claim 1, wherein the metal surface is roughened by a chemical or mechanical process.

Claim 10 (Original): The method of claim 9, wherein the chemical method is an alternative oxide solution.

Claim 11 (Original): The method of claim 1, wherein the bond has a peel strength of from 4-10 pounds per linear inch.

Claim 12 (Original): The method of claim 11, wherein the bond has a peel strength of from 6-8 pounds per linear inch.

Claim 13 (Original): The method of claim 1, wherein the metal comprises copper, nickel, gold, silver, tin, lead, iron, or mixtures thereof.

Claim 14 (Original): The method of claim 12, wherein the polymer material comprises a pre-preg, an imageable dielectric, a photoimageable resin, a soldermask, an adhesive, or a polymeric etch resist.

Claim 15 (Original): The method of claim 12, wherein the roughened and primed metal layer bonded with the polymer material is a layer of a multi-layer circuit board.

Claims 16-18 (canceled)

Claim 19 (Previously Amended): A method of treating a metal comprising:

- a) chemically roughening the metal with an adhesion promotion composition comprising an oxidizer, an inorganic acid, or mixtures thereof;
- b) priming the roughened metal with a liquid primer composition comprising ~~one or more organo-silicon compounds, one or more silsesquioxanes, or mixtures thereof,~~ and an organic polymer, an organic oligomer, and an organic monomer, or mixtures thereof; and
- c) applying a polymer material to the roughened metal with the liquid primer to form a bond with the roughened metal.

Claim 20 (Original): The method of claim 19, wherein the polymer material is an inner-layer of a multi-layer printed circuit board.